

## REMARKS

The Official Action dated May 24, 2007 has been carefully considered. Accordingly, the changes presented herewith, taken with the following remarks, are believed sufficient to place the present application in condition for allowance. Reconsideration is respectfully requested.

By the present Amendment, claims 2 and 7-9 have been amended. Support for the Amendment may be found in original claims 1-24. Since these changes do not involve any introduction of new matter, entry is believed to be in order and is respectfully requested.

In the Official Action, the drawings were objected to for containing reference characters not mentioned in the description. Paragraphs [0065] and [0066] have been amended to include reference to the identified reference characters. Support for the amendments to the specification are found in figures 12 and 13. Since these changes do not involve any introduction of new matter, entry is believed to be in order and is respectfully requested.

In the Official Action, the Examiner objected to the Specification due to some minor informalities. The informalities noted in the Official Action have been corrected. Specifically, paragraph [0001] of the specification and the Abstract have been amended in view of the Examiner's remarks. Whereby, the Examiner's objection has been overcome and reconsideration is respectfully requested.

In the Official Action, claim 2 was objected to due to a minor informality. The informality noted in the Official Action has been corrected. Whereby, the Examiner's objection has been overcome and reconsideration is respectfully requested.

In the Official Action, claims 7-9 were rejected under 35 U.S.C. §112, first paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner asserted that the limitation "the

first control parameter” recited in claims 7-9 lacked antecedent basis. By the present Amendment, claims 7-9 have been amended to show dependence from claim 2 which recites the limitation of “a first control parameter.” Since this change does not involve any introduction of new matter, entry is believed to be in order and is respectfully requested.

In the Official Action, claim 23 was rejected under 35 U.S.C. §102(b) as being anticipated by Paik et al. (US 6,163,621). The Examiner asserted that Paik et al. discloses a method of processing an image, the method comprising: capturing an image of an object; and applying controlled, equalization to an image generated by the image capture device, where the controlled, histogram equalization uses a concentration ratio.

However, as will be set forth in detail below, it is submitted that the method of processing an image of claim 23 is not anticipated by Paik et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Claim 23 relates to a method of processing an image. The method comprises capturing an image of an object and applying controlled equalization to the image generated by the image capture device. The process of controlled, histogram equalization uses a concentration ratio.

More specifically, the subject application teaches the use of a concentration ratio in conjunction with controlled histogram equalization. The concentration ratio determines the smoothness of an image or portion of an image such as a specific tile. The concentration ratio (CR) is defined in terms of the population (P) at a level (L) of the histogram such that:

$$CR = \frac{\left( \sum_L P_L \right)^2}{\left( \sum_L P_L^2 \right)}$$

The CR indicates how concentrated or widespread the population distribution of the histogram is. Generally, if the population is distributed evenly across all levels, the CR is a large number. If the entire population is concentrated at a few levels, the CR is generally a small number.

The Examiner has referenced col. 4, line 64 and col. 9, line 43 of Paik et al. as teaching the use of a concentration ratio. Applicant respectfully disagrees with this characterization of Paik et al. Paik et al. merely discloses a ratio, not a concentration ratio. The ratio used in Paik et al. is defined in terms of the total brightness levels (K) contained in a window and the total number of pixels in the window such that:

$$ratio = \frac{K}{P \cdot Q}$$

This ratio is fundamentally and mathematically different than the concentration ratio taught in the subject application. As such, Paik et al. does not teach the use of a concentration ratio.

To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 U.S.P.Q.2d 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Further, the reference must describe the Applicant's claimed invention sufficiently to place a person of ordinary skill in the field of the invention in possession of it. *Akzo N.V. v. United States Int'l Trade Comm'n*, 808 F.2d 1471, 1479, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986), *cert denied*, 482 U.S. 909 (1987); *In re Coker*, 463 F.2d 1344, 1348, 175 U.S.P.Q. 26, 29 (CCPA 1972). Paik et al. fails to teach or suggest a method of processing an image comprising, *inter alia*, a controlled, histogram equalization using a concentration ratio. The ratio recited in Paik et al. does not disclose or teach a concentration ratio as taught and defined in the subject application

such that a person of ordinary skill in the field of the invention would be in possession of it. Because Paik et al. does not teach every element and limitation of the claimed invention, Paik et al. does not anticipate the claimed invention. Reconsideration is respectfully requested.

In the Official Action, claims 1, 4-6, 10, 14-16, 20 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sussman et al. (US 5,686,960) in view of Charpentier (US-PGPUB 2004/0119233). The Examiner conceded that Sussman et al. fails to teach, disclose or suggest determining the concentration ratio for the one of a plurality of tiles. The Examiner asserted that Charpentier et al. discloses a word game and method of play where the ratio of one of a plurality of tiles is determined. The Examiner asserted that at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the word game and method of play wherein the ratio of a plurality of tiles is determined with the histogram equalization method of processing images, system, and computer program of Sussman et al. to implement the subject invention. The Examiner asserted that the motivation to combine the teachings of Sussman et al. and Charpentier because the features of Charpentier create a game suitable for children, in which a player is required to match randomly selected letter tiles with the corresponding letters within words, as well as providing a method for playing a word game, which is designed for the enjoyment and education of children by incorporating the identification skills, together with their imagination enabling the formation of words.

However, as will be set forth in detail below, it is submitted that the methods, systems, and computer readable medium as defined by claims 1-24 of the subject application are nonobvious over and patentably distinguishable from Sussman et al. in view of Charpentier. Furthermore, Charpentier is non-analogous art and, as such, cannot serve as the basis for a rejection. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The Charpentier reference is non-analogous art which cannot form a basis for rejecting the subject application. In order for an Examiner to rely on a reference in rejecting an applicant's invention, "the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); see also *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); and *State Contracting & Eng'g Corp. v. Condotte America, Inc.*, 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) ("where the general scope of a reference is outside the pertinent field of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved."). The subject application discloses a method and image processing system for reducing artifacts in images caused by image processing. Charpentier is related to a word game apparatus and method of playing a word game. Charpentier does not contain any teaching or reference to image processing or reducing artifacts in images due to image processing. As such, Charpentier is not relevant to the particular problem with which the subject application is involved. Accordingly, Charpentier is non-analogous art that cannot be used as a basis for rejecting the subject application. Reconsideration of the rejections based on Charpentier is respectfully requested.

Moreover, references relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Furthermore, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

Independent claims 1, 10, 20, and 24 of the subject application recite the limitation of "determining a *concentration* ratio for the one of a plurality of tiles" (emphasis added). As discussed hereinabove, the concentration ratio (CR) determines the smoothness of an image or portion of an image and is defined in terms of the population (P) of each level (L) of a histogram such that:

$$CR = \frac{\left(\sum_L P_L\right)^2}{\left(\sum_L P_L^2\right)}$$

Charpentier does not teach or suggest a concentration ratio of an image that determines the smoothness of an image. Indeed, Charpentier does not contain any reference or teaching directed to image processing or the use of a concentration ratio for image processing. Instead, Charpentier teaches a children's word game that includes a number of playing pieces or tiles having letters or symbols (insignias) thereon. Paragraph [0045], lines 4-12 of Charpentier referenced by the Examiner specifically recites that "the total number of these playing pieces is not critical, however a ratio of the various insignias can be determined based on the language in which the game is being played or other selected criteria." The concentration ratio CR taught in the subject application is patentably distinguishable from the ratio of insignias on gaming pieces disclosed in Charpentier. As such, Charpentier fails to disclose the limitation of determining a concentration ratio for one of a plurality of tiles as taught and disclosed in the subject application.

Because neither Charpentier nor Sussman et al. teach, suggest, or otherwise disclose determining a concentration ratio for one of a plurality of tiles, the references do not teach every limitation of independent claims 1, 10, 20, and 24 of the subject application. Accordingly,

Applicant asserts that claims 1, 10, 20, and 24 are non-obvious over Sussman et al. in view of Charpentier and respectfully requests reconsideration of the rejections.

Based on the foregoing arguments, it is believed that claims 2-9 that depend from independent claim 1, claims 11-19 that depend from independent claim 10, and claims 21 and 22 that depend from independent claim 20, are in proper condition for allowance.

In the Official Action, claims 2, 7-9, and 17-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Charpentier, as applied to claim 1, and further in view of Kim (US 6,078,686). The Examiner conceded that Sussman et al. and Charpentier do not teach all the limitations of claims 2, 7-9, and 17-19. Specifically, the Examiner has conceded that Sussman et al. and Charpentier do not teach processing a first control parameter and the compression ratio to obtain a second control parameter as recited in claim 2; disclosing the mathematical root of the first control parameter, the concentration ratio, or both as recited in claims 7 and 17; multiplying one of the groups of the first parameter, the concentration ratio, or both by a number as recited in claims 8 and 18; or combining the first control parameter with a concentration ratio as recited in claims 9 and 19. The Examiner has asserted that Kim et al. provides each of these teachings.

However, as will be set forth in detail below, it is submitted that the methods and systems as defined by claims 2, 7-9, and 17-19 of the subject application are nonobvious over and patentably distinguishable from Sussman et al. and Charpentier further in view of Kim.

Kim teaches an image quality enhancement circuit and method wherein a ratio  $q$ , defined as the ratio between the original luminance signal and the resultant luminance signal, is used. The concentration ratio CR as defined in the subject application and discussed hereinabove is fundamentally and patentably distinct from the ratio  $q$  as defined in Kim.

References relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Furthermore, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

As noted hereinabove with respect to independent claims 1 and 10, from which claims 2, 7-9 and 17-19 depend, Charpentier is non-analogous art that may not form a basis for rejecting the claimed subject matter. Moreover, the combination of Sussman et al. with Charpentier does not teach or suggest each limitation of the claimed subject matter. Specifically, neither Sussman et al. nor Charpentier teach or suggest the use of a compression ratio CR as defined in the subject application.

The deficiencies in the combination of Sussman et al. and Charpentier are not overcome by further combination with Kim. Moreover, Kim, alone or in combination with Sussman et al. and Charpentier, fails to teach all the limitations of the claimed invention. By way of example, neither Kim, Charpentier nor Sussman et al. teach the limitation of a compression ratio as claimed and defined in the subject application. While Kim teaches the use of a ratio, the concentration ratio CR of the subject application is fundamentally and patentably distinct. The ratio q in Kim is defined as the ratio between an original luminance signal and the resultant luminance signal. This is unrelated to the compression ratio CR of the subject application which is defined in terms of the population (P) of each level (L) of a histogram such that:

$$CR = \frac{\left(\sum_L P_L\right)^2}{\left(\sum_L P_L^2\right)}$$



Accordingly, it is submitted that the method claimed in the subject application is patentably distinguishable over the combination of Sussman et al. and Charpentier further in view of Kim whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 3 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Charpentier, as applied to claims 1, 10, and 24, and further in view of Sawada et al. (US 7,023,582). The Examiner conceded that Sussman et al. and Charpentier fail to teach creating a first output including creating a first lookup table, and creating the second output including creating a second lookup table as recited in claims 3 and 13. The Examiner asserted that Sawada et al. teaches an image processing apparatus, where the first output is created including creating a first lookup table and a second output is created including creating a second lookup table. As motivation for combining Sawada et al. with Sussman et al. and Charpentier, the Examiner asserted that the features of Sawada et al. provide an image processing apparatus with compatibility of proper gray reproduction and high chroma color representation, proper black reproduction of a photograph portion, reproduction of a black character, and elimination of instability of dark color reproduction can be realized.

However, as will be set forth in detail below, it is submitted that the methods and system as defined by claims 3 and 13 are nonobvious over and patentably distinguishable from Sussman et al. and Charpentier further in view of Sawada et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

References relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public.

*In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Furthermore, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

As noted hereinabove, with respect to independent claims 1 and 10, from which claims 3 and 13 depend, Charpentier is non-analogous art that may not form a basis for rejecting the claimed subject matter. Moreover, the combination of Sussman et al. with Charpentier does not teach or suggest each limitation of the claimed subject matter. Specifically, neither Sussman et al. nor Charpentier teach or suggest the use of a compression ratio CR as defined in the subject application.

Sawada et al. discloses an image processing apparatus and, more particularly, an image processing apparatus for generating an address based on minimum and maximum values among signals indicating the three primary colors. Sawada et al. does not teach the use of a compression ratio as defined in the subject application.

The deficiencies in the combination of Sussman et al. and Charpentier are not overcome by further combination with Sawada et al. Moreover, Sawada et al., alone or in combination with Sussman et al. and Charpentier, fail to teach all the limitations of the claimed invention. By way of example, neither Sawada et al., Charpentier nor Sussman et al. teach the limitation of a compression ratio as claimed and defined in the subject application. Accordingly, it is submitted that the method claimed in the subject application is patentably distinguishable over the combination of Sussman et al. and Charpentier further in view of Sawada et al. whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 11-12 and 21-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Charpentier, as applied to claims 1, 10, and 20, and

further in view of Hannah (US 5,859,710). The Examiner conceded that Sussman et al. does not disclose a system where the printer is coupled to the processor as described in claims 11 and 21, or that the image capture device is coupled to the processor as recited in claims 12 and 22. The Examiner asserted that Hannah teaches a digital copying system using a high-speed data bus without the use of data buffer, where the printer is coupled to the processor and where the image capture device is coupled to the processor. As motivation for combining Hannah with Sussman et al. and Charpentier, the Examiner asserted that the features of Hannah would enable the transmission of the digital image signal from the external processor to the printer for rendering the digital image signals onto the physical medium without prior interim storage of the digital image signals in a buffer board on the printer.

However, as will be set forth in detail below, it is submitted that the methods, system and computer readable medium as defined by claims 11-12 and 21-22 are nonobvious over and patentably distinguishable from Sussman et al. and Charpentier further in view of Hannah. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Hannah teaches a copier for rendering an image of an object onto a physical medium. The copier includes a scanner, a printer and an external processor. Hannah does not teach a method of processing an image to reduce artifacts caused by image processing. Further, Hannah does not teach using a compression ration CR as defined in the subject application.

References relied upon to support a rejection under 35 O.K. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Furthermore, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

As noted hereinabove with respect to independent claims 10 and 20, from which claims 11-12 and 21-22 depend, Charpentier is non-analogous art that may not form a basis for rejecting the claimed subject matter. Moreover, the combination of Sussman et al. with Charpentier does not teach or suggest each limitation of the claimed subject matter. Specifically, neither Sussman et al. nor Charpentier teach or suggest the use of a compression ratio CR as defined in the subject application.

The deficiencies in the combination of Sussman et al. and Charpentier are not overcome by further combination with Sawada et al. Moreover, Hannah, alone or in combination with Sussman et al. and Charpentier, fails to teach all the limitations of the claimed invention. By way of example, neither Hannah, Charpentier nor Sussman et al. teach the limitation of a compression ratio as claimed and defined in the subject application. Accordingly, it is submitted that the method claimed in the subject application is patentably distinguishable over the combination of Sussman et al. and Charpentier further in view of Hannah whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

It is believed that the above represents a complete response to the Examiner's rejections under 35 U.S.C. §§102, 103 and 112 and places the present application in condition for allowance. Reconsideration and an early allowance are requested. Please charge any additional fees required in connection with the present communication, or credit any overpayment, to Deposit Account No. 04-1133.

Respectfully submitted,

/Geoffrey L. Oberhaus/

Geoffrey L. Oberhaus, Esq.  
Reg. No. 42,955  
DINSMORE & SHOHL LLP  
1900 Chemed Center  
255 E. Fifth Street  
Cincinnati, Ohio 45202  
(513) 977-8623